

BODY STRUCTURE FOR A VEHICLE, PARTICULARLY A PASSENGER CAR

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a body structure for a vehicle, and more particularly to a structure for a passenger car having a vehicle occupant compartment with a rollover bar behind the seats.

[0002] EP 0 976 620 A1 describes an open passenger car which is provided with a rollover bar device fastened to a vehicle occupant compartment. The rollover bar device has a single rollover bar which spans a vehicle occupant space of the passenger car in the transverse direction of the vehicle and consists of a non-metallic material.

[0003] EP 0 286 058 A2 comprises a self-supporting structural element made of a composite material for a vehicle body. The structural element is formed by a wall part having an intermediate body which is bounded by cover layers. This structural element should have a good strength/weight ratio.

[0004] U.S. Patent No. 3,145,000 discloses a high-strength, glass-fiber-reinforced component for a wing of an aerodynamic vehicle. The wing is provided with a wall section which has a core, for example, consisting of a honeycomb structure, embedded in covering

walls.

SUMMARY OF THE INVENTION

[0005] An object of the present invention is to provide a vehicle body structure for a vehicle, particularly a passenger car, in which a rollover bar device is mounted in a highly stressable manner on a vehicle occupant compartment of the body structure. The rollover bar device, while having a low weight, is connectable in a simple and economical manner with the vehicle occupant compartment..

[0006] According to the invention, this object has been achieved by a wall structure extending adjacent to the vehicle occupant seats and the rollover bar device that consist of a high-strength non-metallic material, such as a fiber-reinforced plastic material, and that are constructionally inseparably combined.

[0007] Among the principal advantages achieved with the present invention are that the rollover bar device and the vehicle occupant compartment, because they consist of a high-strength non-metallic material, such as a fiber-reinforced plastic material, are optimized with respect to a lower weight and a high strength. Because of this selection of material and as a result of the type of connection, the vehicle occupant compartment and the rollover bar device can also be produced in an advantageous manner. In particular, their inseparable connection eliminates expensive screws whose bores have a

cross-section-weakening effect. Furthermore, the individual rollover bars of the rollover bar device, which are constructed only in the area of the vehicle seats, contribute to obtaining constructive degrees of freedom.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings.

[0009] Figure 1 is a perspective top view of a body structure of a passenger car according to the present invention; and

[0010] Figure 2 is an enlarged sectional view along line II-II of Figure 1.

DETAILED DESCRIPTION OF THE DRAWINGS

[0011] For purposes of simplification, essentially only a vehicle body 2 comprising a vehicle body structure 3 of a passenger car 1 having an open construction is illustrated. The vehicle body structure has a vehicle occupant compartment 4 with a vehicle occupant space 5 having receiving devices 6, 7 for two vehicle occupant seats 8, 9, respectively, arranged side-by-side. The vehicle occupant compartment 4 consists of a non-metallic material, such as a fiber-reinforced

plastic material-composite material, and has a wall formation 10 with a forward wall structure 11 and a rearward wall structure 12 which are attached to a floor structure 13.

[0012] The floor structure 13 is bounded on the longitudinal sides 14, 15 by side members 16, 17 which have a box-shaped cross-section and extend between the wall structures 11, 12. The floor structure 13 has a transmission tunnel 18 extending between the forward wall structure 11 and the rearward wall structure. An example of a high-strength non-metallic material is found in above-mentioned EP 0 286 058 A1, and the material can be used with vehicle body structures of the type disclosed herein.

[0013] Behind the vehicle occupant seats 8, 9, a rollover bar device 19 is arranged adjacent to the rearward wall structure 12. The rollover bar device 19 extends transversely to the longitudinal direction A-A of the vehicle and is also produced of a high-strength non-metallic material, such as a fiber-reinforced plastic material (CFK). The rollover bar device 19 is constructionally, specifically inseparably, combined with the vehicle occupant compartment 4 or with the wall structure 12. The rollover bar device 19 is formed by two individual rollover bars 20, 21 which are mounted in the area of the receiving devices 6, 7 of the vehicle occupant seats 8, 9 on the rearward wall structure 12 and each has two upright rollover bar columns 22, 23.

[0014] In the sectional view of Figure 2, each individual rollover bar, for example, 22, comprises upright leg walls 24, 25 spaced in the longitudinal direction A-A of the vehicle and a web wall 26 extending between the leg walls 24, 25. On the free ends 27, 28, the rollover bar columns 22, 23 have flange devices 29, 30 which extend to the rearward wall structure 12 and rest in recesses 31, 32 of the last-mentioned wall structure, specifically by way of glued portions 33, 34. The flange device 29 is provided with flanges 35, 36 which are aligned transversely to the longitudinal direction A-A of the vehicle. The web wall 26 is constructed for supporting, for example, a removable roof in a general known manner and has a groove 37 into which a sealing body can be inserted also in a generally known manner. The sealing body acts between the individual rollover bar 22 and the roof (not shown).

[0015] The foregoing disclosure has been set forth merely to illustrate the invention and is not intended to be limiting. Since modifications of the disclosed embodiments incorporating the spirit and substance of the invention may occur to persons skilled in the art, the invention should be construed to include everything within the scope of the appended claims and equivalents thereof.